

Claims

1. Method of processing IP packets in a telecommunication equipment comprising the following steps in the following order :
 - 5 in the incoming direction :
 - IP packet validation,
 - options field management,
 - filtering,
 - first next layer decision and forwarding;
 - 10 in the outgoing direction :
 - redirect management,
 - TTL management,
 - source address management,
 - options field management,
 - 15 • packet fragmentation.
2. Method according to claim 1, wherein, in case of IP packets originated from or destined to the equipment, said method further comprising the following steps in the following order :

in the incoming direction, after the first next layer decision and forwarding step:

 - 20 • IP packet validation,
 - packet reassembly,
 - options field management,
 - second next layer decision and forwarding;

in the outgoing direction, before the redirect management step:

 - 25 • multiplexing of IP payloads,
 - options field management,
 - generation of IP header.
3. Method according to claim 2, wherein, in case of IP packets to be emitted by the equipment:
 - 30 in the incoming direction, after the first next layer decision and forwarding step :
 - a lookup step is performed in order to decide the destination of the incoming packet,
 - in the outgoing direction, before the redirect management step and after the

generation of the IP header step :

- a lookup step is performed in order to decide the destination of the outgoing packet.

4. Method according to claim 3, wherein, in case of IP in IP tunneling, said method further comprises the following steps in the following order :
5 in the incoming direction, after the first next layer decision and forwarding step and before the lookup step :

- determine which headers must be stripped,
- strip the tunnel headers,
- 10 • process the TTL of the stripped headers with the exception of the first one already processed in a preceding step,
- process the CRC of all the stripped headers with the exception of the first one already processed in a preceding step,
- IP packet validation,
- 15 • options field management,
- filtering,
- third next layer decision and forwarding;

in the outgoing direction, after the lookup step and before the redirect management step :

- 20 • redirect management,
- TTL management,
- source address management,
- options field management,
- packet fragmentation,
- 25 • determine which tunnels must be created,
- validate IP address of the incoming packet versus tunnel addresses,
- make address translation from client receiver to tunnel endpoint address and vice versa,
- insertion of external header,
- 30 • process the external header fields forcing the fragmentation flag to "do not fragment" value,
- process the external header options field,
- calculate external header checksum,

- make path MTU recovery,
 - in case errors occurred in transmission, send ICMP messages to the originator of the messages being routed in the tunnel.
5. Method according to claim 3, further comprising :
- 5 in the incoming direction, before the first IP packet validation step :
- MPLS packet input processing,
- in the outgoing direction, after the lookup step :
- MPLS packet output processing.
6. Method according to claim 4, further comprising :
- 10 in the incoming direction, before the first IP packet validation step :
- MPLS packet input processing,
- in the outgoing direction, after the lookup step :
- MPLS packet output processing.
7. Method of processing MPLS packets in a telecommunication equipment
- 15 comprising the following steps in the following order :
- in the incoming direction :
- count received frames and number of octets,
 - validate MPLS packets against label range,
 - determine the interface identification,
- 20
- count of received packets and number of octets,
 - strip of the external MPLS header retrieving the stripped information,
 - lookup for the destination of the incoming MPLS packet,
 - next layer decision based at least on End_of_Stack flag,
- 25
- next layer forwarding,
 - TTL management,
 - if next-hop is not the equipment, PHB determination;
- in the outgoing direction :
- extract TTL from a received outgoing client packet,
- 30
- pass on the received outgoing client packet as a stripped MPLS packet together with FEC, PHB, TTL,
 - generate End_of_Stack bit,
 - pass on the stripped MPLS packet together with FEC, PHB,

TTL and End_of_Stack

- lookup for the destination of outgoing client packets with FEC originated by the equipment,
 - TTL management
- 5 • creation of MPLS header,
- count of transmitted packets and number of octets,
 - pass on MPLS packet, PHB, and Next Hop.
8. Method according to claim 7, wherein, in case of multiple MPLS encapsulation,
- 10 in the incoming direction, the processing steps are repeated on stripped MPLS packet;
- in the outgoing direction, all the necessary MPLS labels are pushed during one MPLS header creation step.
9. Method according to claim 7, wherein, in case of penultimate hop,
- 15 in the incoming direction, the client packet is forwarded to the lower layer is stripped and emitted.
10. Method according to claim 8, wherein, in case of penultimate hop,
- in the incoming direction, the client packet is forwarded to the lower layer is stripped and emitted.
- 20 11. Method according to claim 7, wherein the client packet is an IP packet.
12. Method according to claim 7, wherein the client packet is an Ethernet frame.
13. Telecommunication equipment comprising means adapted to carry out the method according to claim 1.
- 25 14. Computer program product comprising computer program code means adapted to perform all the steps of the method according to claim 1 when said program is run on a computer.
15. Computer readable medium having a program recorded thereon, said computer readable medium comprising computer program code means adapted
- 30 to perform all the steps of the method according to claim 1 when said program is run on a computer.